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Summary

What is quality infrastructure?

Although consumers are not always aware of it, metrology, standards, testing and quality management are vital to products and product processes. Yet they often use test marks as a guide when making purchasing decisions. And their attention is drawn to the area in a negative way when, for example, technical equipment cannot be connected up abroad.

Quality infrastructure refers here to all aspects of metrology, standardization, testing, quality management, certification and accreditation that have a bearing on conformity assessment (abbreviated as MSTQ). This includes both public and private institutions and the regulatory framework within which they operate.

How does quality infrastructure contribute to sustainable development?

- It is essential to companies' competitiveness and creates a vital basis for production based on a division of labour and facilitates the international trade in goods. This can lend a considerable boost to the private sector.

- A quality infrastructure is essential in breaking down technical barriers to trade. It is thus the key to the greater integration of the partner countries into the international trade system.

- It is required for the establishment of institutions and the shaping of the domestic enabling environment (good governance) and also the achievement of political objectives in the fields of environment, health and consumer protection.

What assistance is provided through development cooperation for the quality infrastructure?

It has proved more effective to promote the entire quality infrastructure system by means of an integrated approach than to focus in an isolated way on the individual components mentioned above (M-S-T-Q). The focus tends to be on institutional level (meso level) in the individual MSTQ areas. An integrated approach must, however, also take in the political (macro) level and the level of individual businesses (micro level). At macro level, the necessary political support must be secured and must continue after assistance measures have come to an end. At micro level, the aim is to make institutions more service-oriented.

Why is regional cooperation so important in this field?

Regional cooperation promotes the mutual recognition of national structures (and standards) and thus breaks down technical barriers to trade. If an institutional infrastructure is to be built up from scratch, it often makes more sense to do so in a complementary way through regional groupings and to use it jointly (one example is expensive laboratory equipment). This can lend impetus to the process of regional integration.

What is the comparative advantage of German development cooperation?

The implementing organizations of German development cooperation can offer a high degree of technical competence in the field of quality infrastructure, as traditionally associated with the "Made in Germany" epithet. In combination with the institutions' many years of experience in development cooperation, they can thus offer a very concrete and practical range of support. In principle, all instruments of bilateral and multilateral cooperation can be used for the development of the quality infrastructure.
1. Purpose of the strategy paper and definition of the area

1.1 Purpose of the strategy paper

The strategy paper explains the importance of a quality infrastructure for the economic and social development of our partner countries. It outlines the main functions it fulfills for an economy based on the division of labor, for trade, for protection of the environment, health and consumers and also for good governance and rural development.

The sector strategy paper is a guide and an aid to decision-making in the process of selecting, appraising and assessing German development projects and is also a binding sector policy standard for planning and implementing these projects. As part of the process of focusing on priority areas, it also constitutes a substantive contribution and sector policy basis for defining Germany's position within the international context.

The sector strategy paper provides guidance for non-governmental organizations, such as churches or political foundations, and is a source of information for members of the public interested in development policy. It supersedes the 1994 sector strategy "MSTQ - Metrology, Standards, Testing, Quality Management".

1.2 Definition of the sector

This strategy defines quality infrastructure as all aspects of metrology, standards, testing, quality management, certification and accreditation that have a bearing on conformity assessment (abbreviated as MSTQ, which is used in this strategy paper synonymously with the term quality infrastructure). This includes both public and private institutions and the regulatory framework within which they operate.

The services provided by various quality infrastructure institutions help to boost competitiveness and allow production to be based on a division of labor (cf. chapter 2.1). They are important for the establishment of regional markets, for allowing goods to be traded internationally and are one of a range of instruments used in dismantling technical barriers to trade (cf. chapters 2.2, 2.3). MSTQ therefore falls within the BMZ priority area of Economic Reform and Development of the Market System. It can also make a contribution to other sectors, and this strategy paper shows how it touches on the relevant sector strategy papers (cf. chapter 2.3).

The assistance provided in the field of quality infrastructure should form part of an overarching priority area strategy or should be implemented as a coherent sub-strategy in its own right.
2. Importance of quality infrastructure for the partner countries

German development policy is guided by the principle of global sustainable development and aims to help build a secure global future. An overarching goal of development policy is poverty reduction, and measures from the four dimensions of sustainable development - a thriving economy, ecological compatibility, social justice and political stability - help to achieve this aim.

MSTQ helps to promote sustainable development mainly by:

- boosting the private sector by making companies more competitive,
- paving the way towards further integration of the partner countries in the interests of a fairer global trade regime,
- establishing institutions and influencing the enabling environment at national level.

This is where this particular area comes into the implementation of the German government’s Programme of Action 2015 for halving extreme poverty\(^1\), in particular priority areas 1 and 3: "boosting the economy and enhancing the active participation of the poor" and "creating fair trade opportunities for the developing countries". The aim of measures in the first area is to promote sustainable and broad-based pro-poor growth. Measures in priority area 3 are aimed at reducing poverty by integrating the partner countries into the global economy. The goal is for our partners to be enabled to enjoy the advantages of globalization and effectively protect themselves from the risks.

The Programme of Action 2015 sets out Germany’s contribution to the Millennium Goals\(^2\) and is in line with the goals contained in the final documents of the International Conference on Financing for Development and the World Summit on Sustainable Development.

Efforts in this area are a reaction to the important signals for development policy contained in the 2001 WTO Doha Ministerial Declaration, which acknowledges that technical support and capacity-building in the area of trade are a key element in development\(^3\).

With regard to policy coherence within the German government, there is no apparent conflict of aims with other ministries.

2.1 Structure, tasks and functioning of a quality infrastructure

A quality infrastructure operates on the basis of a number of components (cf. figure 1). The institutional form the system takes and the range of services supplied within the individual components must take account both of the partner countries' needs and also of its resources and limitations.

2.1.1 Metrology

Measures are not a natural phenomenon. They have to be defined, described and disseminated. These are the tasks of a national metrology institute\(^4\). Measures are disseminated to users on a voluntarily basis via a network of calibration laboratories, which have normally undergone a process of accreditation as proof of their competence. In the field of legal metrology, this task is also performed by the verification service which checks compliance of measuring instruments subject to legal control with the regulations, identifies them and punishes infringements.

2.1.2 Standardization

"Standardization is the systematic unification process by which tangible or intangible subjects are reduced to a desired degree of order by the joint efforts of the interested parties for the benefit of the entire community." (DIN 820, part 1).

\(^{3}\) Ministerial Declaration WT/MIN(01)/DEC/1.
\(^{4}\) In Germany, the Physikalisch-Technische Bundesanstalt.
Standards serve, for example, to describe the state of the art, point technical developments in the right direction at an early stage, define the requirements to be met by products and procedures, facilitate the interchangeability of technical components and set technical specifications for product testing. This gives market participants a uniform basis for assessing product quality and for goods to be labelled accordingly (conformity assessment, cf. also chapter 2.1.5). Standardization promotes the rapid spread of technical knowledge and thus helps to make small and medium-sized enterprises in particular more competitive and innovative.

As a part of technical regulations, they are an integral component of the economic and legislative system and a basic element in such important areas as environmental protection and health and safety at work.

The main tasks of a standardization organization are to support the standardization process, harmonization and coordination (e.g. with works standards). Often, systems run by the private sector are in place, thus ensuring the strong involvement of industry and other interest groups. Such organizations can also be public institutions.

### 2.1.3 Testing

Protective provisions and standards are meaningless unless testing is carried out to ensure that they are being complied with. The tests are as varied as the areas that must be regulated. They can range from a simple visual check to testing under special laboratory conditions. If the test is passed, a special inspection stamp is often issued, such as the test badge for cars or the verification mark for measuring instruments (cf. figure 2).

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5 Definition of quality: The degree to which a set of inherent characteristics fulfils requirements (EN ISO 9000:2000, 3.1.1).

6 The DIN German Institute for Standardization is a private-sector organization.

7 The Bundesanstalt für Materialforschung und -prüfung (Federal Institute for Materials Research and Testing - BAM) is a public law body and a higher federal authority that falls under the remit of the Federal Ministry of Economics and Labour. It is concerned mainly with materials technology, testing, chemical analysis and also many aspects of safety. Well known testing organizations in Germany are the Technische Überwachungsvereine (TÜV), which also perform a wide range of testing and supervision on the state's behalf.

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### 2.1.4 Quality management systems

The aim of quality management is to prevent mistakes and to guarantee and improve the quality of products and processes. Proof that a quality management system is in place is normally issued through a certification procedure (cf. also chapter 2.1.5). Increasingly, such proof is being demanded before contracts are signed; usually it is ISO 9001 that is taken as a basis. It is the most widely internationally used system standard for quality management systems.

### 2.1.5 Conformity assessment, certification

Conformity assessment is the systematic testing to examine whether a product or a process fulfils certain standards as specified in standards or normative documents. There are also standards defining the requirements for the conformity assessment authorities. If the test has been carried out by an independent third party, a conformity certification is issued. This is different from the conformity declaration made by manufacturers or by the customer, for example as part of a supply agreement. Often, declarations or certification of conformity must be provided before a contract is concluded or before a product is brought onto the market. The CE mark denotes that a product meets EU standards and facilitates the free trade within the EU of products bearing this certificate (cf. figure 2).

Examples of certification marks are the GS product safety label and the VDE label for electrical and electronic equipment, components and cables (cf. figure 2), which are issued once the certification procedure has been successfully completed and which indicate that the manufacturing process and the products are regularly inspected.

### 2.1.6 Accreditation

Accreditation is the formal confirmation by an independent third party that a body is competent to perform certain tasks. This is based on international standards. Accreditation is a means of building confidence in the work and the findings of testing and calibration laboratories and inspection and certification bodies (conformity testing bodies). It applies for a fixed period of time and includes monitoring...
measures. It facilitates the mutual recognition of certificates of conformity and promotes international trade.

2.2 Importance of international and regional organizations

International cooperation is a vital tool in dismantling technical trade barriers:

- It was the increase in international trade in industrial products in the mid-19th century that led to the founding of the Convention of the Metre in 1875\(^8\), whose aim was to develop and introduce a standardized international system of units of measurements. Today, its work focuses on ensuring that the national metrology institutes are carrying out their work of measuring and calibrating correctly; it does this by means of confidence-building measures, such as comparison measurements. This ensures that measures are internationally comparable and facilitates mutual recognition of measurements and calibration.

For pragmatic reasons, the large number of national public institutes means there is a need for close regional formalized cooperation, on which the Convention of the Metre relies. Regional metrology organizations ensure the accuracy of measurements within the region and promote the regional use of national measurement and calibration capabilities.

- The need to agree on international standards led in the early 20th century to the founding of the International Electrotechnical Commission (IEC) and the International Organization for Standardization (ISO). Although over 70 per cent of the ISO’s member organizations come from developing countries, they have so far played little role in international standardization efforts (cf. also chapter 2.4).

- International organizations of accreditation bodies\(^9\) promote the foundation of relevant regional organizations, build trust in the competency of their members and thus facilitate international recognition of certificates.

- At European level, the European Organization for Quality promotes development of and information on quality management systems. It develops harmonized training programmes with internationally recognized qualifications in the field of quality, the environment and health and safety at work.

- Within the World Trade Organization (WTO), the committees relevant to quality infrastructure - those on technical barriers to trade (TBT)\(^10\) and sanitary and phytosanitary measures (SPS)\(^11\) - offer a forum for discussing questions relating to technical cooperation in this field. They conduct analyses of need and endeavour to boost the exchange of information and experience between the member states. In order to overcome technical barriers to trade, the members of the World Trade Organization (WTO) are called upon to promote the establishment of the appropriate infrastructure in developing countries and to help them implement these agreements.

2.3 The role of a quality infrastructure in economic and social development

Whilst it is relatively easy to calculate the costs of establishing and operating a quality infrastructure, it is hard to quantify the benefits. A functioning quality infrastructure helps to increase productivity in manufacturing and service delivery. This helps to create jobs, encourages investment and can promote the careful use of natural resources. A quality infrastructure also helps bring about improvements in health care and distribute national wealth more equally.

The system of industrial production based on the division of labour and the international exchange of goods and commodities demand that materials, components and manufacturing processes should be standardized in order to ensure that products have certain specified characteristics. A functioning MSTQ

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\(^8\) Its over 50 member countries, including all the industrialized nations, account for over 90 per cent of world trade.

\(^9\) International Laboratory Accreditation Cooperation (ILAC) and International Accreditation Forum (IAF).

\(^10\) Agreement on Technical Barriers to Trade.

\(^11\) Agreement on Sanitary and Phytosanitary Measures.
system is therefore necessary for the diversification of production and lasting creation of added value in the partner countries and also to ensure the competitiveness of the companies. This applies in particular to small and medium-sized companies, which rely on the support of MSTQ services.

For **export**, the producers in the partner countries must meet the demands of the target markets in terms of quality, safety, reliability, environmental compatibility and hygiene and be able to provide credible proof of this. This is all the more true for **agricultural products**. A prerequisite for this is the existence of a quality infrastructure that meets international standards and that monitors the production chains and furnishes the proof required. If this infrastructure is not in place or if it is underdeveloped, this need to furnish proof can constitute a technical barrier to trade. Indeed, with the growing number of standards and technical rules imposed by the market and the ever higher demands, technical barriers to trade are becoming an increasingly important issue. Today, they represent a major obstacle to poverty reduction through trade.

In order to **create regional markets**, standardized regulations are required. National regulations and standards need to be harmonized or replaced by regional regulations and standards. In parallel with this, an acceptable MSTQ structure needs to be built up to establish the technical and administrative requirements for the testing and control of these standards. The process of EU enlargement is an example of how wide-ranging a process this is and how much time, advice and expense is involved.

For the **domestic market**, the quality infrastructure has a protective function, amongst other things. It provides the necessary structure for effective market monitoring and **consumer protection**. For this purpose, products are examined to ensure that they conform with safety regulations, for example, or for any hazardous properties. Quantitative measurements are also required (weight, volume, length) so as to protect the producer (often small farmers) or the consumer from being charged false prices and to create the necessary conditions for fair trade and, therefore, social justice.

Shaping the **domestic environment for business and society** so that it conforms with development objectives is a major task of the legislature (**good governance**). It is thus the task of the state to regulate matters relating to the system of measurements applied, the regulations and standards for the environment, health and safety and the responsibilities of state and private organizations. States with efficient public structures - including a large number of quality infrastructure institutions - are better able to articulate the interests of their citizens in the framework of global policy-making and to implement international regimes. Yet not all tasks relating to MSTQ need to be performed by state bodies. By relieving the **public administration** of such tasks, capacities can be freed up for other tasks, the state can be encouraged to use public resources responsibly and the groups concerned are motivated to take the initiative themselves.

Many regulations concerning the use of **natural resources** are tied to measurable parameters (e. g. regulations concerning consumption of resources, water and energy and limits on the amount of pollutants emitted in waste gas and wastewater). Controls must be carried out to monitor adherence to the relevant environmental standards, the standards must be developed and adapted and sanctions imposed for any contravention of the regulations. The MSTQ sector establishes the necessary technical framework.

Measurements are a key **daily feature of medical practice** (body temperature, blood pressure, composition of the blood etc.). They are required for recognizing and treating illnesses and are used to make decisions on the required therapy. False measurements and the resulting false decisions can, at best, generate additional costs and, at worst, be harmful to health or even fatal.

### 2.4 Existing situation in the partner countries

In the industrialized countries, MSTQ systems have been developed over a number of decades and adapted to technological progress through a dialogue between state and industry. Many partner countries have not undergone the same historical development. Generally, though, some structures are in place. Mostly the tasks are taken on by just a few institutions or even one single (state) organization. Although there are considerable regional differ-

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12 e. g. the coordination of work in the field of standardization and the provision of testing and calibration services.
ences, most countries are not yet capable of fully delivering the services that industry needs. There is often a lack of specialist knowledge, suitable equipment and information about both the country's own needs and international developments. Policy-makers often lack an awareness of the significance of a functioning quality infrastructure for economic and social development; as a result, the institutions do not receive the necessary support.

If producers in the partner countries wish to offer competitive products, those products must possess the properties prescribed in the normative documents on the target markets and pass the relevant tests. Often, there is insufficient knowledge of these. It is all the more difficult to prove conformity with these standards and rules if the measuring and testing institutions are not in place or if the results are not recognized because tests were not carried out in accordance with international standards.

These deficiencies then continue at a higher level. A lack of relevant experience at the technical level makes it harder for the partner countries to be involved in shaping international regimes. The vicious circle is then complete, because the interests of the partner countries are not properly or adequately taken into account. As a result, the countries' competitiveness, the diversification of their economies and their equal integration into the global economy suffers.

3. Experience to date and conclusions

The support provided by multilateral organizations for quality infrastructure in partner countries is normally part of larger programmes to promote the private sector, trade capacities, agricultural production for export and the implementation and monitoring of environmental legislation. A short description of the assistance provided by multilateral organizations can be found in Annex 3.

3.1 Experience of bilateral development cooperation

Germany's efforts to foster the quality infrastructure in the partner countries have already gone a long way towards enhancing competitiveness, making production processes more environmentally-friendly, improving consumer protection and promoting regional cooperation. Rather than supporting individual components, it has proved best to pursue an integrated approach in order to provide balanced and needs-oriented support for the entire quality infrastructure system. This approach reflects the close connection and interdependence between the individual elements in a functioning quality infrastructure system (see also figure 1). In individual cases, for example in order to deal with temporary bottlenecks, it may prove useful to provide assistance for individual components of the system. However, it cannot usually be expected that such isolated measures will have a structural impact.

Instead of providing the partner countries with readymade solutions, the aim of efforts to support the quality infrastructure is to improve the skills and capacities of the partner organizations, thus helping them to find their own solutions (capacity building). Efforts build on existing structures. This reduces the amount of investment required and also the risk that the assistance will not be financially sustainable. Approaches of this kind, aimed at altering structures, require a degree of continuity if they are to be sustainable, not least because existing institutions generate costs and require skilled staff.

A mixture of interventions at different levels, adapted to existing needs, has proved the best way of establishing and developing institutional capacities in the partner countries. Assistance focuses on the institutions. By raising awareness amongst decision-makers of the importance of this area, the necessary political support and thus the necessary institutional continuity can be guaranteed. If there is no awareness of the need for a quality infrastructure, the partner countries cannot be expected to make any long-term efforts of their own. And if there is no awareness of the need to improve competitiveness and become inte-

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13 No systematic findings are available on the experience of multilateral organizations in promoting the quality infrastructure.
grated in the trade system, no appropriate political decisions can be made. The result is that existing potential is underused.

In the partner countries, the system is often not sufficiently adapted to the needs of domestic SMIs. It has been shown that involving those who use MSTQ services (SMIs or their representative associations) in the implementation of measures helps to ensure that the responsible institutions take a more needs-oriented approach.

Assistance in the field of quality infrastructure also has a positive impact on regional integration processes. A dialogue focusing initially on technical issues can have a confidence-building impact. This can then help to foster closer contacts at political level. The establishment of a fully formed national infrastructure of the necessary breadth and depth requires investment and ties up resources over a long period. For many countries, that is neither feasible nor useful. Regional cooperation can compensate for this, e.g. through agreements on the joint use of a complementary infrastructure or by strengthening dialogue between experts. As a result, support of this kind can help with the development of regional economic areas. Conversely, it has proved not feasible to establish a structure solely at regional level as a replacement for autonomous national structures.

Increasingly, the measures conducted as part of German development cooperation are being packaged together to form programmes and adapted to national development strategies. Measures to promote the quality infrastructure must also have a clear link to these programmes so as to ensure a systematic approach and avoid piecemeal solutions. It is particularly important that measures should be linked up with or integrated into the measures aimed at promoting the economy. Where links are tenuous, it is harder to maintain the goals that have been achieved.\(^\text{14}\)

Often, the potential of this area is underestimated. This is particularly true of the contribution it can make to aims in priority areas other than trade and business (cf. also section 2.3).

The main comparative advantage of German development cooperation is the way its support and advice is partnership-based and practice-oriented and focuses on fostering processes over the medium and long term. Development cooperation is currently based on the capacities of the implementing organizations GTZ and PTB and the German specialist institutions, such as BAM, DIN, DGQ, VDE and the TÜV, which have many years of broad-ranging experience in the implementation of MSTQ projects. In the field of quality infrastructure, it is possible through these institutions to draw on a large reservoir of experienced experts with concrete experience of the implementation problems connected with the establishment of the European internal market, for example. In this way, German development cooperation is able to meet the partner’s needs by providing a very concrete programme of support with the necessary degree of continuity. The institutions - particularly the PTB, as a specialist institution and implementing organization - can use their wide range of working relations and contacts with national, regional and international MSTQ institutions and organizations in order to support the partners, call on high-performing former project partners in the implementation of assistance measures and thus strengthen South-South cooperation.

### 3.2 Conclusions for German bilateral development cooperation

The following conclusions can be drawn for German bilateral development cooperation from the experience described above:

- So that the desired improvements are maintained when the assistance measures have come to an end, it should be borne in mind account when determining the length of a project that continuity and sustainability are of vital importance in the establishment of quality infrastructures.
- In order to maintain the objectives achieved in the long term, training for senior staff and managers at technical level must go hand in hand with awareness-raising measures at the higher political level. These should include, for example, seminars for decision-makers and visits to institutions in other countries. Similarly, the advice provided to the partner institu-

\(^{14}\) cf. BMZ Spezial January 1999: MSTQ - Results of an evaluation of 9 projects in the sector in 6 countries.
tions calls not only for interventions at macro level but also sample measures at micro level (businesses).

- Greater use should be made of the sector's potential to foster regional integration processes. Action is demanded from the partner countries in terms of spreading and implementing regional trade agreements. The way to do this is through regional cooperation. German development cooperation is already promoting the joint use of national structures that have been developed in a complementary way; it must however take account from the outset of the fact that regional coordination processes take more time.

- In line with the policy of concentrating on priority areas, measures to promote the quality infrastructure must form a component of a larger sector strategy in order to ensure sustainable achievement of the goals. It must be examined what contribution measures can make to the realization of national or regional development strategies and measures should be designed accordingly.

- It should be identified what contribution the quality infrastructure can make to the realization of aims in other priority areas - particularly protection of the environment and natural resources, water management, rural development, state modernization. A concrete and clearly defined range of support measures for these priority areas should then be developed, tested and integrated into the relevant projects in an effective way.

- The range of technical skills that already exists means that a very concrete and practice-oriented range of support is already available, which can be used in a useful and complementary way, e.g. as a complement to the infrastructure funding provided by development banks. Implementing organizations should draw on the professional experience of German institutions when developing quality infrastructure support measures.

4. Notes on implementation

4.1 Objectives

The aim of promoting the quality infrastructure in partner countries is to create the basic institutional framework for

- increasing companies' competitiveness in the interests of an economic policy focused on job creation and poverty reduction,

- increasing the partner countries' integration into the multilateral trade system,

- establishing effective consumer, health, environment and resource protection.

Specifically, this means

- ensuring and improving the competitiveness of products and of the management of institutions (metrology and testing laboratories, standards organizations, certification and accreditation bodies).

The key concern is to promote small and medium-sized enterprises: unlike many large companies, they usually do not have the capacity to conduct all the necessary quality controls themselves. They depend on external services.

As part of trade-related development cooperation for dismantling technical trade barriers, in addition to this improvement of supply capacities:

- enhancing partner countries' capacity to play a part in designing international regimes,

- enhancing partner countries' capacity to implement international regimes.

- Legal certainty and development of the legal system: Technical regulations are required to identify the role of the statutory measuring and testing system and to make stipulations for business e.g. in terms of consumer protection, health and safety and environmental protection. These
should be integrated into the economic and legal system.

As part of effective environmental and consumer protection, products and technical equipment that present a potential risk must be tested for safety by competent bodies, licensed by independent authorities in accordance with the appropriate technical regulations and their use monitored (market access and monitoring). The project proposal must make clear what contribution is to be made to these goals and what impact is intended.

4.2 Promotion principles

The promotional principles are laid out in the guidelines for bilateral financial and technical cooperation with developing countries. These principles also apply to the assistance provided for quality infrastructure.

Development cooperation aims to help the partner country create a better enabling environment. Support should only be given in cases where the market or private sector institutions and self-help organizations are not, or have not yet been, able to offer a solution (subsidiarity).

The assistance policy should be based on a sound analysis of the situation, covering the need for, and demand and supply of, MSTQ services and the legal, institutional and - if appropriate - macroeconomic conditions. The analyses and findings made by other development organizations should also be taken into account.

It should be examined how existing structures and institutions can be strengthened in such a way as to enable them to perform their functions as required. The prospects for success are to be compared with the obstacles, and measures developed to overcome those obstacles.

The partner's own capacities should also be considered. It has proved useful to take a graduated approach with defined staging posts. This reflects the fact that, when establishing technical capacities, it takes time to train staff and build up a body of experience. Part of the support measures should be to provide proof of these capacities in line with international standards. This requires functioning MSTQ structures, which in turn require a framework that has either been stipulated by law or agreed on with the stakeholders concerned; this, too, takes a great deal of time and advice.

4.3 Target groups and mediators

A differentiation should be made between the following target groups in development cooperation measures to support quality infrastructures:

- The ultimate target group is, in fact, the entire population, as more competitive companies, greater integration into the world trade system and improved consumer and environmental protection have a positive impact on the labour market, income levels and quality of life.

The target groups are:

- Businesses and producers in the fields of agriculture, forestry, fisheries and crafts and trades who will benefit from a trade sector regulated by reliable MSTQ services.

- Small and medium-sized enterprises, which, unlike large companies, tend not to have any calibration or testing capacities of their own and can call on the support of central MSTQ institutions. One key factor is that they are enabled to increase sales of their product by being able to provide proof of its quality.

- Domestic trade and export/import, which rely on testing facilities, e.g. for receiving inspections or verification of quantity or quality.

Mediators are the organizations at meso level, either regionally or at the level of individual countries, e.g.

- legal metrology institutions for consumer, health or environmental protection,

- calibration services providing the necessary services for small and medium-sized enterprises in particular,

- national metrology institutes, which hold national standards in the country in readiness to be used as a reference, ensure that
the right measures are passed on and conduct international comparisons,

- standards organizations and information centres, which support the dismantling of technical barriers to trade, disseminate knowledge on international technical regulations and provide access to these sources,
- testing institutes, which conduct professional and independent tests on products, such as foodstuffs, for the purposes of consumer protection,
- accreditation bodies, which assess the competence of certifiers and calibration and testing services and thus provide an assurance of international acceptance for the certificates that are being increasingly demanded in such fields as management of quality, the environment, health and safety at work and hygiene,
- quality associations, which collect know-how on the issues of quality and management systems, develop that know-how and offer their services as trainers and staff certifiers for the training of quality professionals,
- chambers of commerce and industry associations as the representatives of industry, which can act as an interface between their members and other mediators and can also operate as multipliers for awareness-raising measures.

Assistance measures must be accompanied - and in some cases preceded - by activities at the higher political level. These are aimed at decision-makers who set the political and legal framework in the countries and regions.

4.4 Promotion strategy and its implementation

The desired aims can only be achieved if efficient structures are established and developed, based on the conclusions drawn in section 3.2 The key features of the promotional strategy are:

- needs-oriented promotion of the relevant institutions and their human and physical resources in terms of both quantity and quality,
- the integration of these institutions into regional and international structures.

Given the strong division of labour in the quality infrastructure system (cf. figure 1), it makes sense to provide balanced support through an integrated approach that takes into account how highly developed the quality infrastructure in the country concerned is. In countries where structures are weak, assistance will focus initially on establishing the basic functions of a quality infrastructure. Where a functioning basis has already been developed, measures will focus more on promoting sector-specific services that match the partner country’s needs.

This kind of approach must also address various intervention levels: policy, institutional and business level. Awareness-raising measures are required at the higher political level so as to ensure that the proper support is forthcoming, particularly once the assistance measures have come to an end. The promotion of institutional and organizational structures takes in the elements mentioned in section 4.3 under "mediators". It must also be assessed how useful and feasible it is to involve the micro level, the direct beneficiaries of MSTQ services, on a sample basis in order to make the institutions more services-oriented.

The fostering of regional MSTQ measures helps achieve recognition for national structures and allows rules, regulations and standards to be harmonized at regional and international level. It makes it easier to compare measures and analyses. This can bring synergistic benefits for the cooperation between institutions, countries and regions. The foundations are laid for partnership and cooperation and for the regional and international recognition of national structures and thus for the creation of regional markets.

Crucial to the implementation of the strategy is training for specialist and executive staff and advice. Not only technical matters but also organizational and political topics need to be addressed, such as questions relating to the development of needs-oriented services or the formation of the legal framework and economic and environmental policy.

In some cases, cooperation must include the delivery of materials (measuring and testing equipment, standards and standards information systems) required by institutions to perform their work. If the assistance provided is
to be sustainable over the longer term, it must be ensured that the necessary staff, funding and administrative requirements for the operation and maintenance of equipment are in place over the long term and that the equipment conforms with requirements. It should be investigated whether equipment can be delivered as part of financial cooperation (through combined technical and financial cooperation projects).

In principle, all the instruments of bilateral and multilateral development cooperation can be used for developing the quality infrastructure. As in most other sectors, the instruments and the institutions must be combined within a coherent package. This applies to cooperation both with multilateral institutions and bilateral partners but mainly to the German implementing organizations, especially GTZ, PTB, InWEnt and, in specific cases, the KfW Group.

Greater efforts should be made to dovetail efforts with the well-financed programmes conducted by multilateral organizations; the German contribution should concentrate on the advice and training required as a complement to the material infrastructure (buildings and equipment). This model has already proved successful in practice.

With some partner institutions having now developed their skills to a high level, this opens up the opportunity for greater South-South dialogue and increasingly offers an effective and affordable form of cooperation. Vigorous efforts should be continued to use the existing capacities in the partner countries in order to build up national skills and pass on specialist knowledge and experience.

The Public-Private Partnership approach has not so far been routinely used in the promotion of the quality infrastructure. Germany should, however, include it in its programme of assistance. Obvious areas where it could be used are joint measures in the field of training or the development of maintenance and repair services. The private sector could also become more involved in the development of functioning markets for Business Development Services. This would give the central MSTQ institutions a much broader impact and foster the division of labour between public and private institutions.
List of abbreviations

BAM  Federal Institute for Materials Research and Testing, Germany  www.bam.de
BMZ  Federal Ministry for Economic Cooperation and Development, Germany  www.bmz.de
CE   Communautés Européennes
DIN  German Institute for Standardization  www.din.de
DGQ  Deutsche Gesellschaft für Qualität e. V.  www.dgq.de
EOQ  European Organization for Quality  www.eoq.org
EU   European Union  www.europa.eu.int
GTZ  Deutsche Gesellschaft für Technische Zusammenarbeit  www.gtz.de
IAF  International Accreditation Forum  www.iaf.nu
IEC  International Electrotechnical Commission  www.iec.ch
ILAC  International Laboratory Accreditation Cooperation  www.ilac.org
IMEKO International Measurement Confederation  www.imeko.org
InWEnt InWEnt Capacity Building International, Germany  www.inwent.org
ISO  International Organization for Standardization  www.iso.ch
ITC  International Trade Centre  www.intracen.org
ITU-T International Telecommunication Union - Telecommunication Standardization Sector  www.itu.int/ITU-T
JCDCMAS Joint Committee on Coordination of Assistance to Developing Countries in Metrology, Accreditation and Standardization
KIW  Kreditanstalt für Wiederaufbau  www.kfw.de
MSTQ  Metrology, standardization, testing, quality management, accreditation, conformity assessments including certification
OECD Organization for Economic Cooperation and Development  www.oecd.org
OIML Organisation Internationale de Métrologie Légale  www.oiml.org
PPP  Public-Private Partnership
PTB  National Metrology Institute, Germany  www.ptb.de
SMI  small and medium-sized industry
SPS Agreement on Sanitary and Phytosanitary Measures
STDF Standards and Trade Development Facility  www.standardsfacility.org
TBT Agreement on Technical Barriers to Trade
TÜV  Technical Inspection Association, Germany  www.vdtuev.de
UNIDO United Nations Industrial Development Organization  www.unido.org
UNCTAD United Nations Conference on Trade and Development  www.unctad.org
VDE  Association for Electrical, Electronic and Information Technologies, Germany  www.vde.de
WTO  World Trade Organization  www.wto.org
Annex

1. Sources of further information

Quality infrastructure

- **www.mstq.info**
  
  Information system with wide range of background information on quality infrastructure and links to other sites. (Currently available only in German, English pages under construction.)

- **www.icatt.bam.de**
  
  Work focuses on transfer of technology and know-how in the fields of management and conformity assessment systems within the Federal Institute for Materials Research and Testing. Includes for example, a modular training concept (MTC) on the subjects of accreditation, certification and testing including the interfaces with standardization, management systems and relevant European organizations (in German and English).

Development cooperation: Business and trade

- **www.wiram.de**
  
  Information portal about Economic Reform and Development of the Market System, a priority area of BMZ activities (in German).

- **http://tcdb.wto.org/**
  
  WTO-OECD database on activities of trade-related development cooperation, data since 2001.

- **http://www.worldbank.org/trade/standards.html**
  
  World Bank information on its research and assistance activities in the field of technical barriers to trade.
2. Assistance activities of multilateral organizations

The World Bank, the OECD and UNCTAD have taken on a leading role in developing strategies and systematically collating experience on supporting the private sector and trade. With this work, they are making a major contribution to improving the analytical basis, achieving an understanding of the wider context and making implementation more systematic\(^{16}\), which is also relevant for support measures in the field of quality infrastructure.

Whilst UNCTAD supports the macro level through its technical cooperation activities (strengthening negotiating capacities, increasing the efficiency of the enabling environment for trade, aspects of international cooperation), UNIDO and the International Trade Centre ITC (UNCTAD/WTO) concentrate on strengthening export-oriented businesses.

The World Trade Organization's (WTO) programme of technical support is aimed at achieving a better understanding of WTO rules (in this case TBT and SPS), their implementation and use and the development of negotiating capacities through regional and national workshops.

"Trade and development" is one of six priority fields of action for the European Community, the aim being to integrate the developing countries more closely into the multilateral trade system. In some instances, the development projects in this field also include components relating to the establishment of a MSTQ system and in general have a strong focus on standardization and conformity assessments.\(^{17}\)

Many of the international technical organizations have bodies dealing specifically with developing countries in order to ensure their greater involvement.\(^{18}\) Where they have re-


\(^{18}\) e. g. ISO (Development Committee), Organisation Internationale de Métrologie Légale OIML (Development Council), International Measurement Confederation IMEKO (Technical Committee 11 - Metrological Infrastructures).

In the multilateral context, there is a range of cross-institutional initiatives in both the development field\(^{19}\) and the technical field.\(^{20}\) Their approach is to systematically integrate cross-cutting issues such as trade promotion in the partner countries' development strategies or to offer fora for the coordination of the assistance strategies of the various players. Efforts to integrate the various different contributions into a coordinated overall programme make sense and must be continued. At the same time, there should be an appropriate balance of coordination efforts and actual implementation of the measures. It makes sense for the coordination of individual contributions to be concentrated in the partner countries themselves, with the involvement of all the relevant players there.
Figure 1. Independent certifiers test, assess and confirm (certify) that products and systems conform with the relevant standards or technical regulations (conformity assessment). Authorized accreditation bodies test, confirm and monitor their competence and that of measurement and testing service providers.
Figure 2. Common testing and conformity assessment marks.